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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/910,959	07/24/2001	Karl-Anton Starz	33766W035	3644

7590

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EXAMINER

CANTELMO, GREGG

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 04/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/910,959	STARZ ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Gregg Cantelmo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-23 is/are pending in the application.
- 4a) Of the above claim(s) 11-14, 16-21 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 15 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

*ic*

## **DETAILED ACTION**

### ***Response to Amendment***

1. In response to the amendment received March 3, 2005:
  - a. Claims 1-4 and 6-23 are pending with claims 11-14, 16-21 and 23 withdrawn from consideration;
  - b. The claim objection has been withdrawn in light of the amendment;
  - c. The 112 rejection is withdrawn in light of Applicant's response;
  - d. The prior art rejections are withdrawn.

### ***Information Disclosure Statement***

2. The information disclosure statement filed March 3, 2005 has been placed in the application file and the information referred to therein has been considered as to the merits.

### ***Election/Restrictions***

3. This application contains claims 10-14, 16-21 and 23 are drawn to an invention nonelected with traverse. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 4,421,617 (Gratzel) in view of either U.S. patent No. 5,489,563 (Brand) or U.S. patent No. 5,767,036 (Freund).

Gratzel discloses particles of not greater than 500 Angstroms, which is 50 nanometers (col. 1, ll. 35-37) comprising one or more noble metals (col. 1, ll. 55-68) alone or in combination with one or more base metals, the nanoparticles provided in an aqueous solution with a polysaccharide stabilizer (abstract and col. 1, ll. 33-35 as applied to claim 1).

The term "can be" in claims 2 and 3 is a term which does not positively require the subsequent process limitations (pyrolysis of claim 2 and acid/alkali bond breaking of claim 3). The prior art employs polysaccharides as a temporary stabilizer (col. 8, line 64). Since this is the same material exemplified within the instant application, there is a reasonable expectation that the prior art gum polysaccharide stabilizer "can be" removed by pyrolysis at temperatures up to 250° C (claim 2) and "can be" removed by breaking glycosidic bonds of the gum arabic in the presence of acids or alkalis (claim 3).

The pH ranges is between 6.5-7.5 (col. 13, ll. 1-5 as applied to claim 4).

The noble metals include Pt, Pd, Ru, Rh, and Ir as examples (col. 5, ll. 29-32 as applied to claim 6).

The maximum particle size is 500 Angstroms, as discussed above which is equivalent to 50 nanometers (as applied to claim 7).

The difference between claim 1 and Gratzel is that Gratzel does not teach or suggest a total chlorine content of less than 100 nm.

In the examples of Gratzel, an exemplary Pt catalyst is formed from chloroplatinic acid. Brand teaches of forming platinum alloy catalysts using non-chlorinated sources of platinum rather than chlorine containing platinum sources, such as platinum (IV) nitrate for the purpose of providing finely dispersed particles with a homogenous distribution (coll. 3, ll. 10-25). Freund alternatively discloses platinum catalysts formed from platinum (IV) nitrate (col. 4, ll. 5-12).

Platinum (IV) nitrate, being an exemplified precursor in the instant application is thus held to provide catalyst materials having low chlorine content. Furthermore since the materials in the prior art are in the genus of the instant application, there is a reasonable expectation, absent clear evidence to the contrary, that the prior art precursors will provide noble metal catalysts having a chlorine content less than 100 ppm.

The motivation for using platinum (IV) nitrate is that it provides for a noble metal catalyst having a low chlorine content.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Gratzel by replacing the chloroplatinic acid precursor with platinum (IV) nitrate since it would have generated a noble metal catalyst having a low chlorine content.

### ***Response to Arguments***

5. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

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6. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gratzel in view of either Brand or Freund as applied to claim 7 above, and further in view of Stamp, previously made of record.

The concentration of platinum is 3.5 mg/25 cc which falls within the range of claim 9 (Table 1 of Gratzel as applied to claim 9).

The difference not yet discussed is of the polysaccharide being one of gum Arabic, xanthan gum and tragacanth.

Gratzel discloses of generic polysaccharides as a catalyst stabilizer.

Stamp teaches that gum Arabic can provide stabilization to a noble metal catalyst.

The polysaccharide is gum arabic (col. 8, line 64 as applied to claim 8).

The concentration of particles in the aqueous solution is 50 mg/L to 1000 mg/L (col. 8, ll. 54-59 as applied to claim 9).

The weight ratio of the noble metal to the stabilizer is anywhere from about 3:1 to 1:100 and especially from 1:1: to about 1:10 (col. 9, ll. 8-11 as applied to claim 10).

The motivation for using the stabilizer gum Arabic and ratio of stabilizer to catalyst therein is that it is shown in the art to be a know material which provides stabilization to a noble metal catalyst and therefore could have been reasonably and suitably been employed as such given the teachings of the prior art of record.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Gratzel by further defining the polysaccharide of Gratzel to a be a specific gum Arabic in the weight ration as

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shown in Stamp since it would have provided a suitable stabilizing polysaccharide for stabilizing the noble metal catalyst. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

### ***Response to Arguments***

7. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

8. Claims 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 197 54 304 A1 (DE '304) in view of either Brand or Freund.

Claim 15 appears to only require the presence of nanoparticles and not the polysaccharide. The polysaccharide used in the process of making the nanoparticles and claim 1 being drawn to the intermediate combination of the noble metal and polysaccharide temporary stabilizer. The temporary stabilizer is not disclosed as being present in the MEA and the product of claim 15 is interpreted in terms of the positive elements present in the product and not the intermediate composition to obtain the nanoparticles.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is

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unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

“The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature” than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

In that respect, DE '304 discloses a MEA comprising noble metal nanoparticles (abstract and page 2, ll. 30-31 as applied to claim 15).

The loading is 0.35 mg/cm<sup>2</sup> of Pt (page 3, ll. 25-27 as applied to claim 22).

The difference between claims 15 and 22 and DE '304 is that DE '304 does not disclose providing a low chlorine content to the aqueous solution and hence generating a catalyst having a low chlorine content.

Brand teaches of forming platinum alloy catalysts using non-chlorinated sources of platinum rather than chlorine containing platinum sources, such as platinum (IV) nitrate for the purpose of providing finely dispersed particles with a homogenous



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distribution (coll. 3, ll. 10-25). Freund alternatively discloses platinum catalysts formed from platinum (IV) nitrate (col. 4, ll. 5-12).

Platinum (IV) nitrate, being an exemplified precursor in the instant application is thus held to provide catalyst materials having low chlorine content. Furthermore since the materials in the prior art are in the genus of the instant application, there is a reasonable expectation, absent clear evidence to the contrary, that the prior art precursors will provide noble metal catalysts having a chlorine content less than 100 ppm.

The motivation for using platinum (IV) nitrate is that it provides for a noble metal catalyst having a low chlorine content.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of DE '304 by replacing the chloroplatinic acid precursor used therein to form the catalyst material with platinum (IV) nitrate as taught by either Brand or Freund since it would have generated a noble metal catalyst having a low chlorine content.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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FAXES received after 4 p.m. will not be processed until the following business day.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo  
Primary Examiner  
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**GREGG CANTELMO**  
**PRIMARY EXAMINER**

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April 11, 2005